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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/849,049	05/05/2001	David Walter Smith	PRIM-020	9063

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John B. Sowell
182 Midfield Road
Ardmore, PA 19003-3213

EXAMINER

ALIE, GHASSEM

ART UNIT	PAPER NUMBER
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3724

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/849,049

Applicant(s)

SMITH ET AL.

Examiner

Ghassem Alie

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☒ Claim(s) 1 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

Specification

1. The specification is objected to under 37 CFR 1.71 for not disclosing (a) how the carrier supports 37, 38 are able to position the substrate/wafer vertically. Is the substrate positioned horizontal on the substrate carrier 41, 42 of the carrier support 37, 38? See page 11, lines 5-25.
2. The specification is objected to because of the following informalities: on page 11, line 29, "as shown at 42" should be --as shown at substrate carrier 42--.
3. The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

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4. Claim 1 is objected to because of the following informalities: “ a carrier support on a first linear transport” should be --a first carrier support on the first linear transport-- and “a second linear transport” should be --the second linear transport--. See claim 1, lines 20-25.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The disclosure fails to teach how the substrate/wafer is vertically positioned on the substrate carrier of the carrier support.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-7, 10, and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding Claim 1, line 18, “ while mounted on the carrier support by cutting the substrate/wafer as it passes in both directions” is not clear. It is not clear whether the substrate is mounted ^{on} ~~to~~ the carrier support or the cutting means is mounted on the carrier support.

Regarding claims 10 and 11, “the movable frame” lacks antecedent bases.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 1, as best understood, is rejected under 35 U.S.C. 102(b) as being anticipated by Ono (4,688,540). Regarding claim 1. Regarding claim 1, Ono teaches a bi-directional cutting saw 2 for singulation of substrate and dicing of the wafers W including a first and second linear transport means 12 which are arranged parallel to each other and each transport means 12 having a linear actuator 26A and 26B. Ono also teaches a carrier support 14A and 14B movable by the linear actuator 26A, 26B. Ono also teaches means positioning each 14A and 14B sequentially from a load/download station to a vision positioning station 86A and then to a singulation cutting station 2. The wafer W is placed on the wafer supporting means 50A by a load and unloads means, which is not shown. See col. 14, lines 10-25. Ono also teaches that each carrier support 14A, 14B is reciprocating back and forth in an X-axis direction at the cutting station 2. Ono also teaches cutting means 158A and 158 B for separating semiconductor wafer W devices from one another as carrier support passes in both X-directions under the cutting means 158A, 158B. Ono also teaches that the simultaneously cutting a first wafer W on the carrier support 14A and on the first linear transport means 12 and positioning a second wafer W on a second carrier support 14B ready for cutting on the second linear transport means 12. Figs. 1-4 and col. 3, lines 1-53 and col. 4, lines 6-68.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono. Regarding claim 2, Ono teaches everything noted above including that the carrier support is adapted to receive an adaptor 52A and a gasket 50A supporting the wafer W on the carrier support 14A, 14B. The pate 50A is considered to be gasket since is made of a porous material such as porous ceramic. Ono does not expressly teach that the wafer is a rectangular strip. However, official notice is taken that the surface 50A of the support carrier 14A, 14B can also support a wafer with rectangular shape or any other shape.

Regarding claim 3, Ono teaches everything noted above including that the carrier support means 14A, 14B rotating the strip exactly 90 degree from a predetermined position. See col. 1, lines 65-68 and col. 2, lines 1-10 and col. 5, lines 40-68.

13. Claim 5-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of Carter (5,249,491). Regarding claim 5, Ono teaches everything noted above including that the cutting means 158A, 158B are mounted on a support means (152A, 134, 152B, 136) for vertical movement of each cutting means 158A, 158B and sequent engagement of the cutting means with the wafer W. The support means is defined by the support frame 152A, 152B and the shaft 134, 136. Ono does not teach that the cutting means or blades 158A, 158 are counter-rotating blades and the support means engages one of the

blades into engagement with the wafer when the wafer is moving in a X direction and engages the other blade into the engagement with the wafer when the wafer moves in direction opposite to the first X direction. The blades 158A, 158B are rotating in same direction and cut the wafer W in a first X direction and a second X direction but not in an opposite direction than the first X direction. However, blades 158A and 158B are distanced and positioned in such a manner that it would take the same time for blade 158A, 158B to cut the wafer on the cutting lines even if they were counter-rotating blades. Carter teaches a pair of counter rotating blades 558, 560 which the first blade 558 cuts the wood in X direction and the second blade 560 cuts the wood in an opposite direction than the first direction. See Fig. 7 and col. 10, lines 32-45 in Carter. It would have been obvious to a person of ordinary skill in the art to replace Ono's cutting blades with the counter-rotating blades as taught by Carter since it will take Carter's cutting blades to cut a wafer cut-line the same time as Ono's cutting blades.

Regarding claim 6, Ono teaches everything noted above including that the blade support means 152A, 134, 152B, 136 includes a rocking frame 176A, 176B mounted on a pivot shaft 134, 136. See Fig. 3 and col. 8, lines 16-45 in Ono.

Regarding claim 7, Ono as modified by Carter teaches everything noted above including that the pivot shaft 134, 136 is movable in a clockwise and /or a counter-clockwise position to position one of the blades as taught by Carter in a downward Z direction. See Fig. 3 in Ono and Fig. 7 in Carter.

Regarding claim 8, Ono as modified by Carter teaches everything noted above including a front substrate support 14A coupled to the front linear actuator 26A and a rear

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substrate carrier support 14B coupled to the rear linear actuator 26B. Ono also teaches that one of the wafer carrier supports 14B moves transversely from a load and unload station to a vision positioning 86B station while the other carrier support carrier 14A moves into engagement with the a pair of the counter-rotating blades as taught by Carter. See Fig. 1 and in Ono and Fig. 7 in Carter.

Regarding claim 9, Ono as modified by Carter teaches everything noted above including means 162A, 162B for vertically moving downward one of the blades into engagement with the wafer W while simultaneously vertically raising the other saw blade. See col. 16, lines 33-68 in Ono.

Regarding claim 10, as best understood, Ono as modified by Carter teaches everything noted above including that the movable frame 152A, 152B on which the pair of the counter blades are mounted is supported by a pivot shaft 134, 136 and means 164A, 164B for pivoting the frame 162A, 162B on the pivot shaft 134, 136. See Fig. 3 in Ono.

Regarding claim 11, Ono as modified by Carter teaches everything noted above including that the pivot shaft 134, 138 is mounted on and supported by a Y-axis gantry 118, 132 for supporting the blades in Y-axis relative to a wafer W. See Fig. 3 in Ono.

Regarding claim 12, Ono as modified by Carter teaches everything noted above including that the pivot shaft 134, 138 is mounted on and supported by a Y-axis gantry 118, 132 for supporting the blades in Y-axis relative to a wafer W. Ono as modified by Carter also teaches that the while carrier support 14A, 14B reverse the direction of the wafer by rotation, the counter blade as taught by Carter is capable of engaging with substrate.

Regarding claims 13-16, Ono as modified by Carter teaches everything in claims 5-12.

Regarding claim 17, Ono as modified by carter teaches everything noted above including means 60A, 60B for independently controlling the theta or Z-motion of the each substrate carriers 14A, 14B. See Fig. 2 and col. 5, lines 50-68 in Ono.

Allowable Subject Matter

14. Claim 18 is objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach that the substrate carriers are positioned in a theta or Z-direction so that the carriers do not pass each other in the X-axis direction when moving from one station to another as set forth in claim 18.

Comment

15. It is noted that claim 4 has not been rejected over prior art. However, in view of the issues under 35 U.S.C. 112, first paragraph and the objection to the specification under 37 CFR 1.71 the allowability of claim 4 cannot be commented on at this time.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Osada et al. (6,354,312), Dass et al. (6,357,330), and Ishiwata et al. (6,361,404) teach wafer dicing machine having two rotary saw blades.

Wirz et al. (4,407,262), umahashi (6,345,616), and Arai et al. (2001/0029938) teach a wafer cutting machine having load/unload, cutting, and vision position stations.

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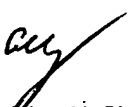
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ghassem Alie whose telephone number is (703) 305-4981.

The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allan Shoap can be reached on (703) 305-1082. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9302 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

GA/ga
August 28, 2003


Allan N. Shoap
Supervisory Patent Examiner
Group 3700